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**Immunopharmacology and Inflammation**

**Suppression of ovalbumin-induced Th2-driven airway inflammation by  $\beta$ -sitosterol in a guinea pig model of asthma**

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In the present study, the efficacy of  $\beta$ -sitosterol isolated from an n-butanol extract of the seeds of the plant *Moringa oleifera* (Moringaceae) was examined against ovalbumin-induced airway inflammation in guinea pigs. All animals (except group I) were sensitized subcutaneously and challenged with aerosolized 0.5% ovalbumin. The test drugs,  $\beta$ -sitosterol (2.5 mg/kg) or dexamethasone (2.5 mg/kg), were administered to the animals (p.o.) prior to challenge with ovalbumin. During the experimental period (on days 18, 21, 24 and 29), a bronchoconstriction test (0.25% acetylcholine for 30 s) was performed and lung function parameters (tidal volume and respiration rate) were measured for each animal. On day 30, blood and bronchoalveolar lavaged fluid were collected to assess cellular content, and serum was collected for cytokine assays. Lung tissue was utilized for a histamine assay and for histopathology.  $\beta$ -sitosterol significantly increased the tidal volume ( $V_t$ ) and decreased the respiration rate ( $f$ ) of sensitized and challenged guinea pigs to the level of non-sensitized control guinea pigs and lowered both the total and differential cell counts, particularly eosinophils and neutrophils, in blood and bronchoalveolar lavaged fluid. Furthermore,  $\beta$ -sitosterol treatment suppressed the increase in cytokine levels (TNF $\alpha$ , IL-4 and IL-5), with the exception of IL-6, in serum and in bronchoalveolar lavaged fluid detected in model control animals. Moreover, treatment with  $\beta$ -sitosterol protected against airway inflammation in lung tissue histopathology.  $\beta$ -sitosterol possesses anti-asthmatic actions that might be mediated by inhibiting the cellular responses and subsequent release/synthesis of Th2 cytokines. This compound may have therapeutic potential in allergic asthma.

**Keywords:** Asthma;  $\beta$ -sitosterol; Cytokines; *Moringa oleifera*; Ovalbumin

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References



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